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A Mystery Polar Satellite, Believed Russian, Spotted

By JOHN W. FINNEY

Special to The New York Times.

WASHINGTON, Feb. 10—An unidentified, silent satellite has been discovered circling the earth in a near polar orbit by United States tracking stations, the Defense

Department said today. The identity and origin of the mystery satellite—which has been dubbed “the dark satellite”—are not known despite nearly two weeks of tracking.

The prevailing belief at the Pentagon, however, is that the object is the final stage of the multistage rocket that launched a Soviet payload into orbit around the moon and the earth last October.

This belief was reflected in the Defense Department announcement, which said the object “may be of Soviet origin.”

The announcement said the satellite was “in a near-polar orbit” — the same course followed by the Discoverer satellites launched by the Air Force from Vandenberg Air Force Base in California.

However, the department said, “this object is slightly smaller than the United States Discoverer carrier rockets, of which six are now in orbit in a somewhat similar path.”

The satellite was first detected late in January by the Navy Space Surveillance System, known as Spasur. The discovery set off considerable speculation and discussion within the Pentagon about its origin and purpose.

It was the first time an unidentified man-made object had been definitely detected in

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SILENT SATELLITE DETECTED BY U. S.

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space. More importantly, there was no assurance that the silent object was not a Soviet reconnaissance satellite surveying the United States like the long-predicted "big brother in the sky."

Identification of the satellite has proved difficult because, unlike all other satellites, it never transmitted radio signals. Nor was there any indication from the United States intelligence network of any launching attempt in the Soviet Union that would explain the presence of the satellite.

Through the memory unit of the Space Surveillance System, which keeps track of the course of all satellites in orbit, it was possible to establish that the satellite was not one launched by the United States or known to have been launched by the Soviet.

Evidence Backs Theory

Discussion turned to the possibility that the dark satellite might, in fact, be the final stage of the Lunik III launching rocket fired by the Russians on Oct. 4. Several bits of evidence seemed to support this now generally accepted possibility.

In the first place, the final stage rocket would have gone into orbit, just like the Lunik III payload, in a highly elliptical path that would have taken it out beyond the distance of the moon and then close in to earth. Under the drag of the earth's upper atmosphere and the gravitational tugging of the moon, the orbit would be changed so that the rocket and payload would come ever

earth in its orbit that it would burn up in the atmosphere in April. Presumably, the final stage rocket is following much the same course.

Furthermore, in the orbit around the earth the Lunik III payload is following a near polar path, taking it over the North and South Poles. This supported the belief that the unidentified object was the final rocket stage following the same orbit.

The size of the object, nearly as big as the upper stage on the Discoverer rockets, also seemed to support the view that it was the final stage of the Soviet moon launching rocket. The final stage of the Discoverer launching rocket is 19.2 feet long and five feet in diameter.

House Group Not Told

Until today the detection of the satellite had been regarded as so secret that the Navy did not tell the House space committee about the development when describing its Space Surveillance System before a closed committee meeting early this week.

Military and civilian space officials and space lawyers have been predicting that nations would launch silent "seeing eye" satellites into orbit to observe the movements of potential enemies.

The United States has under development two such satellites—one known as Samos, which will use photographic devices to survey enemy dispositions, and the other known as Midas, an early warning satellite, which will detect missile launchings by infra-red techniques.

As the Pentagon announcement emphasized, the detection of the "dark satellite" pointed up the effectiveness of the SPASUR system and gave "practical assurance of its ability to pick up orbiting objects in the earth's vicinity."

SPASUR, which went into operation in 1961, is designed to detect silent satellites and keep track of their past, present and future paths as well as

predict when and where the satellites will re-enter the earth's atmosphere.

The system, which is an outgrowth of the Minitrack tracking network developed by the Naval Aesearch Laboratory for the Vanguard Satellite project, establishes, in effect, a radio picket fence that picks up satellites as they pass by.

How System Operates

The system works in this manner:

An east-west fan of radio signals is transmitted up into space. The radio signals are bounced back by a satellite passing overhead. The reflected signals are picked up by highly sensitive antennas.

By studying the change in phase of the reflected signals through radio interferometer techniques, it is possible to determine that an object has been picked up and to calculate its height and course and something about its size.

Spasur consists of two complexes in the Southern part of the United States. The Eastern complex consists of two 108-megacycle radio receivers about 500 miles apart at Fort Stewart, Ga. and Silver Lake, Miss. Equidistant between the two receivers is a 50-kilowatt radio transmitter eighteen miles north of Montgomery, Ala.

Receivers for the Western complex are at the Naval Air Station, Brown Field, near San Diego, Calif., and Elephant Butte, near Truth or Consequences, N. M., and the transmitter at Gila River near Phoenix, Ariz.

The data from the receiving stations are fed into the SPASUR operations center at Dahlgreen, Va., where a computer determines the orbit of the satellite.

To assist in keeping track of satellites, the Navy has worked out a system for visually displaying each satellite in orbit on a map of the earth.

Currently, the Defence Department is monitoring about "a dozen man-made objects moving about the earth in various orbits."